

Lake Iroquois Herbicide Treatment
Testimony to House Environment & Energy Committee on H31
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Lake Iroquois is a 247 acre lake in Chittenden County. It has a public beach and public boat access. It is surrounded by four towns – Williston, Hinesburg, Richmond, and St. George, and is heavily used.

In 2022, our greeters counted over 2200 boats accessing the lake – and the greeters are only on duty Friday through Sunday during the summer.

The Lake Iroquois Association is a relatively young lake association. It was founded in 2007. At its founding the association faced two major problems: high nutrient content with sediment visibly washing into the lake and a large and spreading Eurasian watermilfoil infestation.

The association immediately began an organized effort address these problems: **S**

1. Setting up a greeter program with the hot water boat washer added in 2017
2. Reduction of phosphorus levels and sediment runoff by:
 - a. Tributary monitoring to track sources of pollutants
 - b. Creating rain gardens
 - c. Replanting streambanks to reduce erosion
 - d. Installing catch basins to divert runoff
 - e. Outreach and education including publishing a property owners manual
 - f. Increasing participation in the Lake Wise program
 - g. And creating a website, Facebook page, and email list

These efforts met with notable success by significantly decreasing the phosphorus levels in the lake: <https://www.lakeiroquois.org/water/lake-data-maps>

We also became only the third lake in the state to reach Lake Wise gold status with 15% of the properties on the lake meeting Lake Wise standards.

However, none of this affected the milfoil problem. In fact, it was growing worse and spreading. Milfoil was first identified in Lake Iroquois in the 1990s at the public boat access. Since then it spread and this is what we were seeing (see picture on slide 7 in presentation)

Clearly, we had to do something. We began by doing research and gathering data so that all of our decisions would be evidence based.

First Steps:

1. Quantify the problem and begin tracking it
2. Learn as much as we could about the science on milfoil, how it grows and spreads, its effects on ecosystems, and
3. Research our options to deal with it

To quantify the problem, we brought in an outside consultant to do a full lake plant survey. That 2014 survey found that over 70 acres of the littoral zone (the area of the lake where aquatic plants can grow) were infested with Eurasian water milfoil. Since Lake Iroquois' littoral zone is approximately 100 acres that meant that over 70% of the lake where aquatic plants can grow was infested with an invasive.

Imagine if you were told today that 70% of forestland was densely infested with an invasive!

We also dug into the research about milfoil. Here is some of what we learned:

- Threat to biological diversity, second only to habitat loss (Wilcove et al. 1998).
- Has been shown to displace native species in a span of two to three years. (Lind and Cottam 1969) (Lillie and Budd 1992) (Nichols and Mori 1971).”
- Can alter the chemical and physical properties of water, can accelerate eutrophication by releasing nutrients, especially phosphorus (Carpenter 1980).
- Its decomposition and the increased respiration rates of microbes will lead to lower dissolved oxygen levels in the water column (Grace 1978, Bates 1985)
- Can reduce predation success of larger predator fish, such as largemouth bass, leading to a reduction in the populations of these fish (Engel 1987)
- Reduces spawning success by covering the spawning grounds (Newroth 1985.)
- Invasive species are estimated to cost \$1.4 trillion globally (Pimentel et al. 2001)
- Presence of Eurasian watermilfoil has been shown to have a major impact on land values (Horsch and Lewis 2009, Zhang and Boyle 2010, Rosaen et al. 2012).

We also learned that there is no question that Eurasian watermilfoil is an invasive and is clearly a threat to aquatic ecosystems. Contrary to what has sometimes been suggested, milfoil is not just another weed, nor does it become “native” because it has been around for a while. A few plants here and there might not seem to be a problem and might even seem to provide cover for fish. But this milfoil does not provide appropriate habitat for native species. If ignored and allowed to spread, as happened in Lake Iroquois and has happened in some other Vermont lakes, it will squeeze out native plant species; it will not provide food or habitat for native animal species; and it can eventually lead to degraded water quality and economic loss.

So, we so that we needed to take action and look at the options available. We quickly discovered that there were few options: Diver-Assisted Suction Harvesting (DASH), bottom barriers, hand pulling, herbicide

In DASH, a diver hand pulls milfoil and feeds it into a suction tube that transports the milfoil to a boat where it is then brought to shore and then has to be unloaded and trucked to a location far from the lake to be composted.

Bottom barriers or benthic mats lay on the lake bottom. They can only be used in small areas as they kill everything underneath.

Hand pulling only works for small areas and also has the problem of causing fragmentation which aids the spread, since milfoil is very brittle, and breaks easily. The fragments fall to the lake bottom and easily root, spreading the EWM.

All but the hand pulling require a permit from the DEC.

We decided to begin by applying for and receiving a permit to use DASH

We found that

1. it was slow, ½ to 1 acre/week,
2. expensive – up to \$10,000/week,
3. could still spread milfoil because of fragmentation
4. could disrupt the sediment sending trapped phosphorus into the water column.

We found it most suitable for clearing small areas, such as keeping a boat channel clear and clearing areas around the beach which is how we used it in subsequent years.

It became clear that DASH alone was not ever going to get the infestation down to a manageable level. Even with using DASH and the bottom barriers, the 2019 plant survey showed that we now had 86 acres infested. And it also showed an alarming 28% decline in native plant species.

At this point, we realized we had to look at herbicide. By 2019, ProcellaCOR had become the only aquatic herbicide that was being permitted in Vermont, so we did the research on it, and this is what we learned:

1. Narrowly targeted to Eurasian watermilfoil
2. Effective at very low concentrations: less than 2 ppb
3. No risk to human health; does not cause cancer, genetic mutations, genetic damage (US EPA)
4. Shown to have little to no impact on native plants and no adverse impact on native animals
5. It is not a neonicotinoid (not harmful to bees)
6. Dissipates quickly – often in less than 24 hours
7. Used successfully in many other states including NY, Washington, Wisconsin, New Hampshire, Massachusetts, Minnesota, as well as in Vermont

Given this, we made the decision to apply for a permit to use ProcellaCOR.

This decision was not undertaken lightly. Contrary to some public statements that have been made, it does not seem possible for a lone individual to undertake all that is required to meet the DEC criteria for an aquatic herbicide permit.

Our application was nearly 100 pages and included:

- Integrated Five-Year Pest Management Plan
- Background on the lake
- Treatment Plan, including technical details of application process
- Documentation of control activities for EWM
- Plant survey reports
- ProcellaCOR research, technical, and safety information
- Maps: detailed vegetation distribution and planned treatment areas
- Application forms
- Mail notice of application submission to all properties abutting the lake and one mile downstream. This involved gathering names and addresses from the Grand Lists of three towns (St. George has no properties directly abutting the lake)

While DEC was reviewing our application, we did a number of public presentations, mailed out press releases, sent notices to our entire mailing list, posted information on our Facebook page, and posted all the documents on our website. To the best of our ability, we tried to be transparent and keep everyone informed.

The permit was finally issued in February of 2021, nearly 1 year after we had submitted our application – and 7 years after we began this milfoil research and control project.

The work didn't end there, however. Just because the permit was issued didn't mean we could just treat the lake. The DEC requirements are very stringent and the permit has many conditions and requirements that have to be met. Here is a summary of LIA's To Do List:

1. Complete a pre-treatment plant survey
2. Submit a specific treatment plan for DEC review and approval
3. Coordinate schedules with
 - a) the licensed aquatic herbicide applicator for the treatment
 - b) the Vermont Department of Agriculture pesticide inspector, who must be on site before and during the application
 - c) the third party consulting firm to perform the water sampling 48 & 72 hours post-treatment at three different locations
4. Ensure all the above had the required documentation, maps, and directions
5. Mail notifications to all properties abutting the lake and for one mile downstream - 30 days prior to treatment
6. Have signs made announcing the treatment at or above permit specified size
7. Post signs at every road leading to the lake, public beach, and the public boat access - 30 days prior to treatment

8. Purchase and create system to distribute bottled water to households that draw their water for drinking or food prep from the treated waterbody, and for any household for one mile downstream
9. Schedule the post-treatment plant survey
10. Write and submit an annual pesticide minimization report (required of all permittees every year whether or not herbicide is used that year)

With everything organized, treatment took place the morning of June 28, 2021.

Before I go on to the results, I want to correct some confusion about how it is applied. It has been said that it is sprayed. That is not true. The herbicide is not sprayed. It is fed through hoses which are underwater so that the herbicide is placed directly on the target plants and nowhere else.

The Results

- No viable EWM in treatment area
- Scattered EWM in southern area of lake (hand pulled by LIA members)
- Robust native plant re-growth for most native species within and adjacent to treatment area
- Water lily leaves near treatment area showed some browning on edges immediately after treatment, but recovered by end of season.
- No adverse impact to water quality was and dissolved oxygen levels ranged from 8.3 to 8.6 ppm throughout the water column in the treatment area.
- No adverse impact to aquatic or terrestrial species
- No re-growth of EWM in found in Fall 2021, Spring 2022, or Fall 2022 aquatic plant surveys

This what it looked like (see picture Slide 17)

The post-treatment plant surveys show just how quickly native plants rebounded after treatment. In less than a month native plants were filling in where the milfoil had been:

- Elodea: 26.9% pre-treatment to 44.6% post-treatment
- Muskgrass: 17.9% pre-treatment to 33.8% post-treatment
- White waterlily: 7.5% pre-treatment to 15.6% post-treatment
- Largeleaf pondweed: 11.9% pre-treatment to 22.1% post-treatment
- Coontail (*Ceratophyllum demersum*): 7.8% pre-treatment to 6.5% post-treatment (Note: Fall 2022: 10.1%)

All Plant Surveys can be found here: <https://www.lakeiroquois.org/water/plant-surveys>

Note that Coontail, a native species, is known to be slightly affected by ProcellaCOR. As you can see there was a small drop off but by Fall 2022 it was back to a higher percentage than its pre-treatment occurrence.

The really important point to note here is that contrary to what has been said publicly and in the media, ProcellaCOR does not kill all plant species. As you can see, by narrowly targeting the milfoil, it has actually supported the regrowth of native species.

The careful use of aquatic herbicide allowed us to get this infestation of invasive milfoil under control and it has allowed native aquatic plant species to quickly rebound. Along with decreasing phosphorus levels, the lake is now healthier and in a more balanced and natural state than it has been in many years.

What happens now:

- Continue to implement requirements of the 5-year integrated pesticide management plan
- Monitoring and Prevention
 - Greeter Program & Hot Wash Station at VT F&W boat launch
 - Aquatic Plant Surveys scheduled for June 2023 and August/September 2023
 - Volunteer monitoring and web-based reporting mechanism to detect and report any regrowth
- Outreach and Education
- Mitigation
 - Funding programmed for any required Diver Assisted Suction Harvesting
 - Benthic barriers in storage for use if necessary
 - Goal is to perform hand pulling for any small clumps detected

Also it is important to note that all permits require permit holders to seek permission annually each year to perform DASH, emplace benthic mats, or apply aquatic herbicide-must be evidence-based.

Our work continues. We have several new projects and we have many ongoing projects:

- Beebe Lane Stormwater Improvements: We have been working on this for several years and have now received funding. It will remediate an area at the north end of the lake which has been washing out and dumping pollutants and sediment into the lake.
- Watershed Action Plan: This is a review of the entire watershed to determine other sources of pollutants and to develop additional projects for the next several years.
- Education and Outreach
- Lake Wise Assessments
- Greeter Program
- Regular Plant Surveys
- Water sampling and monitoring

To Summarize:

- EWM is a significant threat - ecologically and economically
- Scientific research and empirical data support this
- Research and data on ProcellaCOR show that it is safe and effective to control and reduce EWM
- The Vermont permitting process is complex, rigorous, based on actual scientific evidence and data
- A lengthy moratorium has the potential to derail current and future successes in controlling the spread or resurgence of this invasive

In closing, I would like to point out that spending money to “study” something that has been widely researched by experts around the country and used without adverse effects in many northern-tier states including Vermont seems wasteful – especially at a time when our lakes are faced with decreasing funding to prevent and control the spread of aquatic invasives. The funding proposed in this bill would be far better spent on the Aquatic Nuisance Control grant in aid program than on studying something that has already been thoroughly studied and proven to work.

Eurasian watermilfoil is an invasive that is primarily spread by humans moving boats and other gear from waterbody to waterbody. If efforts are not made to reduce and control existing infestations, it will continue to spread. What is needed is not a moratorium that removes one of the few tools we have to control such spread. Rather, what is needed is adequate funding and support for prevention and control programs. Prevention is a far better and more cost effective tool but it must be coupled with vigorous control and reduction efforts at those lakes already infested to ensure that invasives are not spread.

What we experienced at Lake Iroquois is an example of what can easily happen to

a lake when an invasive is allowed to spread out of control. It doesn't take long to damage an aquatic ecosystem. The science and the data are clear. The careful and controlled use of this herbicide works and does not cause adverse effects on plants, animals, or humans. Yet this bill exempts lampricide. Lampricide has caused documented, quantifiable harm to aquatic life. That exemption seems to undermine the supposed concern the proponents of this bill have for the safety of aquatic life and the health of our public waters.

The aquatic herbicide permitting process in Vermont is one of the strictest in the nation. It is careful, rigorous, and most importantly, based on actual data and scientific evidence. As our experience shows, the permits have significant requirements that ensure herbicide use is minimized, and that a fully integrated pesticide management plan is in place and is implemented. It would be a mistake to suspend the use of one of the very few tools we have to combat invasive milfoil, causing possibly years of delay in reducing and controlling infestations and allowing it to be spread.

Much of the rhetoric supporting this moratorium is at best misguided, at worst outright fabrication. I urge you not to be swayed by this. Rather look at the data, look at actual evidence, consider the science. EWM is not a native and no amount of wishful thinking or declarations will make it so. It is a dangerous threat to Vermont's public waters. The harm it

can do ecologically and economically is clear. If H31 is enacted, it will be nearly impossible to adequately control this invasive for years. We have already seen it spread and the damage it does. I urge you to not allow any more damage to occur. Please vote no on H31.